

# **ABSTRACT**

The present invention provides novel devices and method for kinetically controlling vapor diffusion in crystal growth. The devices comprise discrete diffusion pathways which control the kinetics of vapor diffusion between the crystal growth solution and the reservoir. The devices can comprise a channel which can be of varying lengths or geometries. The channel can either be static or controlled actively or dynamically. Alternatively, the diffusion pathways are provided by the material of the device itself. The device comprises porous and/or water absorbing materials through which the vapor can diffuse. The vapor diffusion rate can be controlled by the thickness or material of the device, or a combination of both.

1. A device for controlling vapor diffusion in crystal growth, comprising a channel of varying lengths or geometries, the channel being static or controlled actively or dynamically.

2. A device for controlling vapor diffusion in crystal growth, comprising a porous and/or water absorbing material through which vapor can diffuse.

3. A device for controlling vapor diffusion in crystal growth, comprising a channel of varying lengths or geometries, the channel being static or controlled actively or dynamically, and a porous and/or water absorbing material through which vapor can diffuse.

4. A method for controlling vapor diffusion in crystal growth, comprising providing a device for controlling vapor diffusion in crystal growth, the device comprising a channel of varying lengths or geometries, the channel being static or controlled actively or dynamically, and a porous and/or water absorbing material through which vapor can diffuse.

5. A method for controlling vapor diffusion in crystal growth, comprising providing a device for controlling vapor diffusion in crystal growth, the device comprising a porous and/or water absorbing material through which vapor can diffuse.

6. A method for controlling vapor diffusion in crystal growth, comprising providing a device for controlling vapor diffusion in crystal growth, the device comprising a channel of varying lengths or geometries, the channel being static or controlled actively or dynamically, and a porous and/or water absorbing material through which vapor can diffuse.

7. A method for controlling vapor diffusion in crystal growth, comprising providing a device for controlling vapor diffusion in crystal growth, the device comprising a porous and/or water absorbing material through which vapor can diffuse, and a channel of varying lengths or geometries, the channel being static or controlled actively or dynamically.

8. A method for controlling vapor diffusion in crystal growth, comprising providing a device for controlling vapor diffusion in crystal growth, the device comprising a channel of varying lengths or geometries, the channel being static or controlled actively or dynamically, and a porous and/or water absorbing material through which vapor can diffuse, and a channel of varying lengths or geometries, the channel being static or controlled actively or dynamically.

9. A method for controlling vapor diffusion in crystal growth, comprising providing a device for controlling vapor diffusion in crystal growth, the device comprising a porous and/or water absorbing material through which vapor can diffuse, and a channel of varying lengths or geometries, the channel being static or controlled actively or dynamically, and a channel of varying lengths or geometries, the channel being static or controlled actively or dynamically.

10. A method for controlling vapor diffusion in crystal growth, comprising providing a device for controlling vapor diffusion in crystal growth, the device comprising a channel of varying lengths or geometries, the channel being static or controlled actively or dynamically, and a porous and/or water absorbing material through which vapor can diffuse, and a channel of varying lengths or geometries, the channel being static or controlled actively or dynamically, and a channel of varying lengths or geometries, the channel being static or controlled actively or dynamically.